Changing Behavior: Insights and Applications

Annette Frahm, project manager
Dave Galvin
Gail Gensler
Gail Savina
Anne Moser

December 1995
Revised July 1996

Local Hazardous Waste Management Program in King County
King County Water Pollution Control Division
130 Nickerson St., Suite 100
Seattle, Washington 98109
(206) 689-3050; anne.moser@metrokc.gov

Prog-3(12/95)rev.7/96

Introduction

Have you ever tried to get a smoker to stop? A kid to start wearing a bike helmet? An aerosol user to switch? Changing behavior is both art and science, and much can be learned from others' attempts to change behavior that can make our work more effective.

A project team at the Local Hazardous Waste Management Program in King County, Washington, spent several months in 1995 reading behavior change literature from energy conservation, recycling, health education and other fields, looking for insights.

We distilled many of the principles found in the literature into workshops for staff, hoping to make their efforts to change business' and the public's hazardous waste behavior more effective. At the workshops, we presented some key behavior change principles, a panel shared their insights, and staff worked through an exercise to learn how to apply the principles to their work. This report summarizes our findings and includes examples from field experience.

Key findings

A key insight from the project is that **information alone is not enough to change behavior.** As government workers, we often try to solve a problem by creating a brochure, believing that "if we build a brochure, they will come." However, starting with a brochure starts at the wrong end of the process. If information alone changed behavior, there would be no more smokers, all kids would wear bike helmets, and all businesses would follow the regulations.

In reality, there are many barriers besides information to achieving a result. Good project planning identifies and tackles these barriers.

It's important to start any project by **clearly defining the final objective,** the desired end result. Spending time up front clarifying and narrowing the objective is not always easy, but it should pay off later in more effective outreach strategies.

Next, brainstorm who—what audience or group—is important to achieving the desired result. Then get to know that audience: What do they need and want? What do they know? Who do they respect and interact with? What change is needed from the audience to achieve the desired result? Most important, **what are their barriers to making the change?** Use what you've learned to refine your original objective.

It is only at this point, when you've identified key barriers to change and refined your objective, that you should develop **strategies** to

reach the audience. The key principles discussed in this paper—such as using commitment, role models, change agents, credibility, and presenting information effectively—can be used in developing strategies. Last but not least, develop a method to find out how the strategy worked.

Checklist of action steps for behavior change

To help our staff work through the steps described above and apply the behavior change principles, we developed a checklist of action steps (see page 3). Along with the principles, it has proved to be a practical tool. At the first workshop, one staff member used the checklist and principles in brainstorming how to get a reluctant small business to deal with accumulated hazardous waste. That same afternoon he visited the business and tried out his new strategies—and the business owner picked up the phone on the spot and called a treatment, storage, and disposal facility. When properly applied, it works!

The following pages include:

- A checklist of action steps for planning behavior change projects
- A summary list of behavior change principles
- A detailed list of principles, including examples from the research literature and field experience
- A bibliography of sources used in the project

The authors of this report are interested in how these principles work for you. If you'd like to share stories, ideas, and evaluation results, please contact the project manager, Annette Frahm, at the Local Hazardous Waste Management Program in King County.

Mail: c/o King County Water Pollution Control Division
Hazardous Waste Management Program
130 Nickerson St., Suite 100
Seattle, Washington 98109

Telephone: (206) 689-3064

E-mail: annette.frahm@metrokc.gov

Checklist of Action Steps for Behavior Change

This is a circular process. Working through steps 2, 3 and 4 may lead to redefining the objective in step 1.

❒ **1. Define your objective.** What is your desired end result? You may begin by thinking broadly, but narrow your objective so it's achievable and, if possible, measurable. How will you know when you've achieved your desired result?

❒ **2. Select your audience.** Brainstorm the possible audiences you could work with and choose one. Pick the one most likely to get your desired result.

❒ **3. Learn about your audience.** What do they need? What do they want? What do they know? What are their perceptions? Who do they respect? Who do they interact with (business and social networks)? **Define the specific change you want the audience to make** to achieve your overall result.

❒ **4. Find out about your audience's barriers to making the change.** Go ask your audience. Possible barriers include: External: it costs too much, technology isn't available, laws are conflicting, etc. Personal: they don't recognize the problem, don't know what to do, don't consider it a priority, etc.

❒ **5. Develop strategies** to reach your audience, using the behavior change principles (e.g., commitment, feedback, credibility, role models). Are there community or political leaders, associations, retailers, innovators, or other specific target groups that could help you reach your desired end result?

❒ **6. Develop a method to measure** the effectiveness of your strategies. Refer back to your objective in step 1.

Summary: Key Behavior Change Principles

The bottom line

- ❒ **Just providing information has a limited effect on behavior.** There is no clear causal relationship between providing information and changing behavior.

The approach

- ❒ **a. Learn about your customer or audience.** What do they know? Care about? Think about? Who influences them?

- ❒ **b. Address the barriers to changing behavior.** Barriers may be **external** (it costs too much, technology isn't available, laws are conflicting) or **personal** (the person doesn't recognize the problem, doesn't know what to do, doesn't consider it a priority, thinks it's too hard).

Key insights

- ❒ **1. Getting involved is the first step to making a commitment, and making a commitment makes people more likely to act.** Small commitments lead to big ones. Start by getting the shop owner involved in a visit. Then ask them to sign a form stating changes they will make.

- ❒ **2. Feedback and follow-up are important.** Feedback gives people cues about the impacts of their behavior changes. Additional contact is also very important in motivating people to stick with a task.

- ❒ **3. People will listen first to their friends or relatives, or others they see as credible.** What they hear at a dinner party will have more weight than a comprehensive data summary.

- ❒ **4. Change agents and role models are important.** A few people in a group will typically adopt innovative ideas and behaviors first, and spread them through the group. Find these people and help them successfully adopt a new behavior.

- ❒ **5. Changing attitudes may not change behavior.** There is no strong, direct or consistent relationship between attitudes and subsequent action.

❒ **6. Incentives may help change short-term, but probably not long-term, behavior.** People may respond to incentives by changing their behavior, but when the reward is removed, they generally revert to their original behavior.

❒ **7. If you need to provide information, present it effectively.** People are more likely to pay attention to information that is:

❒ **Vivid:** Use language that conjures up a vivid and memorable image, or provide a demonstration that will stick in someone's mind.

❒ **Personal:** Make statistical data personally relevant. Talk about personal consequences or refer to a group with which the person identifies.

❒ **Specific and concrete:** Tell them *how* to do the behavior you want them to do.

❒ **Stated in terms of loss rather than gain:** Focus on showing people or businesses how much they are losing every month or year by not doing a specific behavior.

❒ **Told as a story:** Use success stories as a motivating example.

❒ **Emotional:** People tend to be persuaded more by emotional messages than logical ones.

Key Behavior Change Principles

Much of the work of environmental organizations and agencies ultimately aims to change the behavior of certain audiences or customers. How can these efforts be more effective? Research on behavior change offers some insights.

The bottom line: Just providing information has a limited effect on behavior.

There is no clear causal relationship between providing information and changing behavior. There are two primary reasons why this is true: 1) lifestyle changes require role models; 2) people may ignore information or interpret it so it reinforces existing attitudes, beliefs or values (Jamieson and VanderWerf, 1993).

The approach, part 1: Learn about your customer or audience.

What do they know? Care about? Think about? Who influences them? These insights will help make any attempts to change behavior more effective (see checklist on page 3).

One way to get to know your audience—and be more effective in changing their behavior—is to **involve them in planning the project or program.** A survey of city recycling coordinators nationwide found that cities with higher rates of participation and waste stream diversion placed more emphasis on citizen involvement in both program design decisions and program participation (Oskamp et al., 1994).

Understanding the audience was one key to the success of the Hood River Conservation Project. The program in Hood River, Oregon, planned carefully in advance for community involvement and succeeded in installing major energy-efficiency improvements in 85 percent of all eligible homes between 1983 and 1985 (Hirst, 1987).

The approach, part 2: Address the barriers to changing behavior.

To change an audience's behavior, it is essential to find out about their barriers to change. Barriers may be **external** or **personal.** External barriers include: it costs too much, technology isn't available, it's not convenient, laws are conflicting, etc. Personal barriers include: the person doesn't recognize the problem, doesn't know what to do, doesn't consider it a priority, thinks it's too hard, doesn't have friends doing it, etc. This report primarily addresses personal barriers.

An informal survey asked staff who worked with small businesses in King County what they thought were the businesses' barriers to proper hazardous waste behavior. Cost was first on the list. King County has developed a program to reimburse small businesses up to $500 for money spent on hazardous waste management. However, very few businesses accept the vouchers, and even fewer turn

them in for reimbursement. Clearly other barriers besides cost are involved. Direct surveys of businesses identify convenience as a more important barrier than cost.

One well-respected health education model recommends: 1) systematically analyzing a range of external and personal barriers, and 2) working to make changes in the most important and most changeable of these barriers. Researchers have found that programs using the model are more effective in influencing changes in people's high blood pressure, contraceptive use, smoking, exercise, and consumption of sweet and fried foods (Mullen et al., 1987).

Key Insights

1. Getting involved is the first step to making a commitment, and making a commitment makes people more likely to act.

Small commitments lead to big ones (soliciting a small, short-term commitment is called the "foot-in-the-door" technique). Start by getting the shop owner or resident involved in a visit.

For example, hand them the clipboard to make notes on, ask them to help take measurements, ask them to fill out a questionnaire, etc. Then ask them to sign a form (i.e., make a commitment) stating what changes they will make within a particular time frame. Ideally, another personal contact would occur at the end of that time frame to offer further assistance (Yates and Aronson, 1983).

One study found that the percentage of people agreeing to put an unsightly sign on their front lawn that urged people to drive carefully increased dramatically (from 17 percent to 76 percent) if they had *first* agreed to put a small sign in their car favoring safe driving (Freedman and Fraser, 1966).

Another study used the foot-in-the-door technique to increase recycling behavior. Residents were asked to commit themselves to one, two, or three minor actions: complete a survey about recycling behavior, save cans for one week, or send a postcard to the city council urging an increased recycling program. **As the number of requested commitments increased, so did the recycling behavior.** The effects were still observed 10 months later (Arbuthnot et al., 1976-77).

An energy conservation study asked randomly assigned households for permission to list their names in post-study publicity before the information on conservation strategies was distributed. Although their names were never published, the group that agreed to publicize their results used 15 percent less natural gas and 20 percent less electricity. These differences continued through the winter and summer seasons following the study (Pallak et al., 1980).

The King County Household Hazardous Wastemobile asked people to sign a pledge to take used motor oil to a local business, instead of the Wastemobile, next time they recycled their oil. In return, they received a 12-quart oil collection container. In a follow-up survey, nearly half had already used the container to recycle used motor oil; 94 percent of those said they took the oil to a local business. Both the commitment and incentive may have influenced behavior (Cunningham Environmental Consulting, 1996).

Commitment has the greatest influence when:

- the behavior to be done is clearly stated
- it is relatively convenient to perform
- the pledge is both written and public
- the commitment is made freely
- the person can choose what he or she is committing to do.

Choice increases commitment and increases the person's sense of control. For example, people were more willing to install an automatic day-night thermostat if it had an override mechanism (Yates and Aronson, 1983).

2. Feedback and follow-up are important.

Feedback gives people cues about the impacts of their behavior changes—what works and what does not. The more specific it is, the more useful. Additional contact is also very important in motivating people to *stick with* a task, and it helps to focus attention.

Sometimes feedback is too general to provide useful information. For example, most utility bills are not itemized and cannot show the relative merit of individual conservation practices. This would be like going shopping when you know the total cost of all the purchases but not the price of individual items. One survey found that the average homeowner mistakenly believed that reducing lighting would save as much money as using less hot water (Costanzo et al., 1986).

Different types of feedback can have different impacts. As far back as Thorndike (1927), specific feedback has been proven to be an important means of modifying behavior. More recent studies using specific feedback to reduce energy consumption have had mixed results.

In one study, people provided with daily feedback on electricity consumption used 10.5 percent less electricity. However, another study found that feedback alone was not enough to affect energy consumption. Some people received feedback about consumption three times a week, and others set goals to reduce energy use. Only the group with both the feedback and the difficult goal (20 percent reduction) showed any significant savings (13 to 15 percent) in actual energy consumption (Dennis et al., 1990).

Comparative or social feedback appears to be useful. A large sign was posted alongside an expressway exit showing the percentage of drivers who were not speeding on the previous day. The sign reduced the number of speeding drivers by more than 50 percent. The same sign without any information about prior compliance had no effect (Van Houten et al., 1980).

It is often easier to get people to make an initial change than to maintain it. For example, relapse rates for the common addictions (overeating, smoking, alcoholism) are assumed to range from 50 to 90 percent (Brownell et al., 1986). Some health experts propose a circular rather than linear model of change involving hard-to-break habits. In this model, each relapse is part of a spiral that allows the person to acquire new information or skills that may be helpful later. **Continued contact** at these stages will help maintain the new behavior by enhancing motivation and helping people acquire and practice skills related to maintaining the new behavior (Damrosch, 1991).

Simply reminding people of their initial commitment strengthens a "bond" between commitment and behavior.

One study found that people who were called to remind them of their pledge to donate blood were more likely to show up than those who received the standard appointment reminder (Lipsitz et al., 1989).

3. People will listen first to their friends or relatives, or others they see as credible.

People see information from friends and relatives as more credible than information from other sources. What they hear at a dinner party often has more weight than a comprehensive data summary. When buying a car, their brother's lemon will count for more than an article in *Consumer Reports.*

One study found that farmers would not adopt a new hybrid seed corn, despite positive data from the U.S. Department of Agriculture, until one or two farmers who had tried the seed confirmed its value. Other farmers trusted the information from their neighbors more than that from the government experts (Gross, 1942).

The King County sewer utility has worked with farmers, often in rural areas far from the urban Seattle area, to spread biosolids (solids resulting from the sewage treatment process) on their fields. Experience has shown that reluctance to use the "urban" biosolids is initially high—until a local farmer agrees to be a pilot or test site. Then other farmers can see the results and talk with the local farmer and local extension agent about the benefits. As a result of this approach, demand for King County's biosolids now far exceeds available supply.

Credibility affects the likelihood of behavior change. Research has shown that **the effectiveness of a message depends directly on the credibility of the message's source** (Costanzo et al., 1986).

In one study, researchers mailed brochures describing how to save energy to two groups of apartment dwellers. Half of the brochures were mailed with letters from the state public service commission, and half with letters from a private electric utility. The mailing from the commission resulted in almost twice as many requests for information (18 percent vs. 10 percent) and less energy used (an average of 53 kilowatts less during August) (Craig and McCann, 1978).

Ideas to increase the credibility of your message

a. Work through existing organizations: grassroots organizations, neighborhood groups, churches, clubs, trade organizations. They already have support, membership, credibility, and an established position in the community. Find a way for people to get information from their peers.

A King County agency that offers technical support to small businesses decided to work through a community-based nonprofit organization, the Environmental Coalition of South Seattle, to reach businesses in an industrial area. Businesses were much more willing to talk to the ECOSS representative, and many have contributed membership fees and even time on the organization's board. Neighborhood businesses consider it "their" organization, not something imposed on them by the government, even though ECOSS promotes the government services and sets up the technical assistance visits.

The city of Seattle provides funds to three well-respected community organizations to educate people about less-toxic ways to garden. One organization, King County Cooperative Extension, used its widely-read column in the Sunday *Seattle Times* and suburban newspapers to teach people about "green gardening." Coop Extension has also trained its Master Gardener volunteers on less-toxic gardening. Master Gardeners provide advice to more than 80,000 people each year through clinics and a telephone line. Sixty-seven percent of people surveyed reported changing their gardening practices as a result of advice from Coop Extension.

b. Create new organizations that are unbiased.

The Local Hazardous Waste Management Program in King County may be an example. A survey found that people trusted the LHWMP, a new local government program, more than any other source in identifying that a business is environmentally responsible. In descending order, the other sources were their peers, the media, the business itself and, lastly, the government (Strategic Research Company, 1994).

c. Give out information like *Consumer Reports* about your product.

The *Buy Smart, Buy Safe* consumer guide to less-toxic products is an example. The guide, funded by the King County program, is written and published by a local nonprofit organization with high credibility. It provides information in a format similar to *Consumer Reports* on the health and environmental impacts of household cleaners, pesticides, and other hazardous products.

d. Share personal success stories and arrange for people to meet those doing the desired behavior.

Business recognition programs like EnviroStars recognize small businesses for environmentally friendly behavior. The King County program publishes stories about EnviroStars in the business press. It also produces fliers on "hazardous waste success stories" that staff distribute to business owners during field visits. These stories appear to be effective as credible case studies based on peer business experiences.

4. Change agents and role models are important.

A few people in a group will typically adopt innovative ideas and behaviors first and spread them through the group.

Change agents are respected and have wide-ranging personal networks. Finding these people (business owners, neighbors, community leaders) and helping them adopt a new behavior successfully will help spread the behavior through a population. These key people are often referred to as "early adopters."

The Washington State Energy Office enlisted high-profile architects and builders in designing its Energy Edge program. The projects incorporated energy-efficient improvements into new privately funded, high-profile commercial buildings. The state provided an ambitious energy efficiency goal, technical assistance and a guarantee of the improvements' additional costs if projected energy savings were not realized. The program made energy-efficient design prestigious and a status symbol for new buildings (Dennis et al., 1990).

Behavior modeling is more powerful than providing information.

During the 1930s, the federal government wanted to help farmers adopt better practices and equipment. The first attempt to persuade farmers relied on informational pamphlets. This approach produced few results. A later attempt took the form of demonstration projects. Government consultants worked side by side with farmers on selected farms. This program was a tremendous success. The government-trained farmers served as models for other farmers. When friends and neighbors saw the results of the new methods

(an improved harvest), the techniques and equipment spread rapidly (Nisbett et al., 1976). The King County sewer utility is using a similar technique to encourage the use of biosolids by farmers.

The Green Gardening Program sponsors annual tours of King County gardens grown with little or no pesticides. Most gardens are at people's homes. The gardeners give hourly tours, talking about plant choice, how they solved problems, and how they reduced pesticide and water use. People can touch the plants, ask the gardeners questions, and get a concrete sense of alternative gardening approaches.

Information about innovations will travel through different social and professional networks. One study found that those who tried a new clock thermostat influenced their friends, colleagues, and co-workers, not their geographic neighbors (Darley, 1981). A person might hear about one innovation at work, and another from a friend.

5. Changing attitudes may not change behavior.

There is not a simple or direct relationship between attitudes and actual behavior. Those attitudes which are most closely related to a person's basic values are those which are most likely to be carried into behavior.

For example, while 85 percent of respondents to a survey saw the energy crisis as serious, there was no clear relationship between energy-related attitudes and conservation behavior. In fact, people who cited conservation as the single most important strategy for improving our energy future were no more likely than others to take energy-conserving actions (Costanzo et al., 1986).

6. Incentives may help change short-term, but probably not long-term, behavior.

People often respond to incentives by changing their behavior, but when the reward is removed, they generally revert to their original behavior.

Researchers at an industrial complex gave drivers flyers that prompted seat belt usage and gave belt wearers opportunities to win prizes. Seat belt usage increased in the afternoon when incentives were offered in the morning. However, after the morning incentives were withdrawn, belt usage returned to initial baseline levels (Geller, Davis and Spicer, 1983).

Rewards, particularly large rewards, can actually reduce the likelihood of long-term behavior change. Receiving an external reward may lead a person to come to think that the reward is the motivation for the behavior. When the incentive is removed, people may stop the desired behavior because the reason for doing the action no longer exists (Jamieson and VanderWerf, 1993).

One study compared attitudes toward recycling among people paying flat garbage fees, volume-based fees, and variable fees based on weight. (This variability makes cost more visible.) People with weight-based fees were much more likely to see recycling as an activity involving private costs and benefits rather than simply a public good. The study also found that attitudes toward recycling were the least positive among those paying a weight-based fee (Thogersen, 1994).

Incentives may be less effective at changing behavior than strategies that encourage people to internalize a behavior, such as commitment, norms or social recognition.

A study of bus ridership tested commitment and incentives with three groups: commitment only, incentives only (free bus tickets), and commitment plus incentives. All three groups had much higher rates of bus ridership than did the information-only control group. People in the commitment-only group rode the bus as often as those in the two free ticket groups during a four-week intervention phase and two follow-up periods. In contrast, only one person in the control group rode the bus at all (Bachman and Katzev, 1982).

Rewards distributed through a variable method (such as a lottery) are more effective at changing behavior than if they are distributed in a predictable way.

A study that aimed to increase recycling evaluated several methods: information only, small payment, lottery with larger prize, and more frequent collection. The lottery group showed the largest increase in participation of any group. There was, however, no real change in the amount of paper collected per house in any group (Jacobs and Bailey, 1982-83).

7. If you need to provide information, present it effectively.

While information alone is unlikely to change people's behavior, it is also necessary to provide businesses and the public with information about program services, desired behaviors, issues, or regulations. Paying attention to *how* we present information can improve its effectiveness.

People are more likely to pay attention to information that is:

- Vivid
- Personal
- Specific and concrete
- Stated in terms of loss rather than gain
- Told as a story
- Emotional

Energy auditors used these concepts with good results. One study trained energy auditors to 1) communicate vividly, 2) personalize their recommendations, 3) get homeowners involved in the

audit in order to encourage commitment, and 4) frame information in terms of loss instead of gain. The trained auditors had much greater success in getting people to follow through on their recommendations than did auditors without similar training (Gonzales et al., 1988).

Here are more details about presenting information:

a. Make it vivid

Use language that conjures up a vivid and memorable image: describe a football-sized hole instead of the same number of inches, or compare cost with something familiar, like a six-pack or a Big Mac. Or provide a demonstration that will stick in someone's mind.

Some energy auditors use a "smoke stick" to convince people of the value of weather stripping and caulking. The stick contains a very fine, colored powder that is sprayed like a perfume atomizer. The powder flows on air currents and looks like smoke. When it is operated below a window that has not been properly sealed, the "smoke" rushes along the path of the draft, clearly showing when one is heating the outdoors in winter or drawing heat from the outside in summer (Yates and Aronson, 1983).

A pesticides educator in Thurston County, Washington, did a demonstration of a new flame weeder to be used instead of pesticides on driveways and fencelines. Thirty people came to an open house just to see the vivid demonstration.

b. Make it personal

Make data personally relevant, such as using a business' own utility bill to show savings, instead of a statistical printout. Talk about personal consequences or refer to a group (e.g., African-Americans, trade association members) with which the person identifies.

In one experiment, salespersons gave one of two pitches about cable TV to prospective customers. Customers heard either the normal sales presentation or one that was more vivid and personal. In the latter case, people were asked to conjure up images of *themselves* watching a broader range of entertainment in their living rooms. The study found that people who heard the more personal and vivid appeals were more likely to install the cable TV (Yates and Aronson, 1983).

c. Make it specific and concrete

Tell them *how* to do the behavior you want them to do.

One study of recyclers and non-recyclers found similar attitudes but their level of knowledge of *how* to recycle was significantly different (DeYoung, 1988-89). Participants in another study whose attitudes had been changed toward better dental hygiene actually improved their dental practices *only* if also trained in the specific use of dental floss (Weigel and Amsterdam, 1976).

Clear, specific, concrete information is remembered best. Research found that vague messages about the importance of energy conservation (such as "don't be fuelish") are much less effective than specific recommendations about how to modify current behaviors or than indices, such as the miles-per-gallon rating, that enable consumers to compare the energy use of different cars or appliances (Ester and Winett, 1982).

For example, imagine a 10-second TV announcement at 11 p.m. that depicts a lovely rural scene with a voiceover that says, "To preserve our environment, we must conserve energy." A better design would be an announcement at 11 p.m. that shows a person setting back a thermostat and says, "Now that you're almost ready to go to bed, please turn your thermostat back to 55 degrees. You'll save about 15 percent on your bill by doing this setback regularly" (Winett and Ester, 1983).

d. State it in terms of loss rather than gain

People respond more seriously to a loss than to a gain.

Researchers found that people would work harder to keep from losing $100 than to make an additional $100. The psychological consequences of the two are very different (Tversky and Kahneman, 1981).

People who fear loss are more willing to try an innovation. Focus on showing people or businesses how much they are losing every month or year by not doing a specific behavior.

When the city of Seattle instituted its curbside recycling program, it also raised garbage rates and instituted variable rates based on the size of the garbage can. The potential for a higher monthly bill was used to motivate people to choose a smaller can and begin recycling. Recycling rates increased rapidly.

e. Tell a story

A story about how a company reduced its use of hazardous products or how a homeowner began to compost can be much more effective than a set of abstract instructions or information about the long-term effects of actions. Businesses tend to be "risk averse," so this principle applies particularly to a business setting. Case studies and real, live success stories work.

For example, energy auditors get better results when, in addition to describing average cost-benefit ratios, they also tell the success story of a "superconserver" who saved more energy and money than the average. This provides tangible and dramatic evidence (Yates and Aronson, 1983).

The Seattle and suburban King County newspapers publish stories about gardeners featured in the annual Green Gardening Program

garden tours. The stories, published with color photos in the Sunday editions, tell about the gardeners' plant choices, experiences, and how they grow beautiful gardens with little or no pesticides.

f. Use emotional language

People tend to be persuaded more by emotional messages than logical ones. If messages relate to something people care about, they may be more likely to take action.

Advertisements aiming to reduce the use of pesticides among King County residents have framed the message in terms of potential health impacts, especially on children, because market research has shown that concern about their children's health is a powerful motivator. A bus advertisement showed a child's hand reaching for a ball on a lawn, with the caption, "Child picking up a) ball, b) pesticides, c) both." The radio and bus advertising campaign appears to have had an impact. People who said they were very or somewhat likely to use bug or weed killers on their lawns dropped from 51 percent before the ad campaign to 38 percent following the campaign (Northwest Research Group, 1996).

Final words

We don't pretend to be experts in behavior change. We did secondary research, compiled some key ideas, and are attempting both to apply the principles in our work in King County and to share the principles with others who are also trying to change environmental behavior. We hope to experiment, learn, and adapt in order to make our programs as effective as possible. We're always glad to hear different perspectives and insights. We plan to incorporate our own experiences and others' into a future revision of this report.

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